UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/772,924	01/31/2001	Daiki Masumoto	1359.1036	9962

			EXAMINER
21171	7590	09/16/2004	STREGE, JOHN B

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ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 09/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	**Applicant(s)**
Office Action Summary	09/772,924	MASUMOTO ET AL.
	Examiner	**Art Unit**	
	John B Strege	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *18 June 2004*.

2a) ☒ This action is **FINAL.**   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *2-4,6-8 and 10-17* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *2-4,6-8 and 10-14* is/are rejected.

7) ☐ Claim(s) *15-17* is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *31 January 2001* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some * c) ☐ None of:

      1. ☒ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Response to Amendment/Arguments

1.   This action is responsive to amendment A filed 6/18/04. The amendments to the claims and the specification have been entered. Claims 1, 5, and 9 are now cancelled and claims 15-17 are added. Claims 2-4, 6-8, and 10-17 are now pending.

Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 15-17 recites the limitation "the photometrical variations" in line 4. There is insufficient antecedent basis for this limitation in the claims.

The claims 15-17 are generally narrative and indefinite, failing to conform with current U.S. practice. It appears that something is missing such as a comma or separation. For examination purposes the Examiner has interpreted the claims to mean separating the partial space into a partial space corresponding to geometric variations and a partial space corresponding to photometrical variations, and identifying each of the partial spaces successively using sample data.

Claim Rejections - 35 USC § 103

2.   Claims 2-4, 6-8, and 10-14 are rejected under 35 U.S.C. 103(a) as being

unpatentable over IEEE published *From few to many: generative models for recognition*

under variable pose and illumination by Georghiades et al. (hereinafter Georghiades) in

view of *Face Image Retrieval Using HMM's* by Martinez.

Regarding claim 4, Georghiades discloses that image variability due to changes

in pose and illumination can seriously impair object recognition (stated at least in the

abstract). Further disclosed is an appearance based modeling method for recognizing

objects under large variations in pose and position (fourth and fifth paragraph of the

introduction). A database is disclosed for storing registered images of users (at least the

first paragraph of section 4 Recognition Results). The process for finding the similarity

between an input image and the registered image is disclosed in section 4.2

Recognition Under Variable Pose and Illumination. This is done by capturing a plurality

of pictures of different poses and illumination as seen in figure 3.

Georghiades does not explicitly disclose that in the picture information input part,

a characteristic small region in the object to be a recognition target is selected from a

picture, and the object to be a recognition target is modeld based on information

included in the selected small region and arrangement information of the small region,

and wherein the modeling in the picture information input part is performed by

identifying a partial space in which a vector having a pixel value of the small region as

an element is varied.

Martinez discloses that new facial recognition approaches are needed to robustly identify faces under different illumination conditions, or when the facial expression changes, or when a part of the face3 is occluded on account of glasses or parts of clothing. When face recognition methods have worked in the past, it was only when all possible image variations were learned (from the first paragraph of the abstract). As part of Martinez's approach to make facial recognition more robust he discloses dividing the face images into n different parts and analyzing them locally (first paragraph of section 2). The local area is projected into the eigenspace where learning takes place, where each area is described by a vector in which variance of the images is maximized (second paragraph section 2). In order to ensure that the extracted local information will always be projected into the correct area of the eigenspace information form the adjacent pixels of the areas are also extracted (third paragraph of section 2).This is used to find the best possible global match between a query image and a database image (second paragraph of the abstract).

Georghiades and Martinez are analogous art because they are from the same field of endeavor of facial recognition under variable pose and illumination.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine Georghiades and Martinez to use a characteristic small region, and and varying the pixel value of the small region. The motivation for doing so would be to make the facial recognition system more robust. Thus it would have been obvious to one of ordinary skill in the art to combine Georghiades and Martinez to obtain the invention as specified in claim 4.

Regarding claim 2 Georghiades discloses modeling the illumination and pose using Lambertian reflectance (first paragraph section 2.1).

Regarding claim 3 as seen in figure 2c of Georghiades, a portion of the image is cut out from a picture 2a.

Regarding claims 6-7, Georghiades discloses constructing illumination cones (models based on illumination) and surface cones (models based on pose) to synthesize novel images of an object under differing pose and lighting used in the recognition process (section 2.3 first paragraph). The conditions are modeled separately and then combined to synthesize the image.

Regarding claim 8, Georghiades discloses constructing illumination cones (models based on illumination) and surface cones (models based on pose) to synthesize novel images of an object under differing pose and lighting used in the recognition process (section 2.3 first paragraph). The conditions are modeled separately and then combined to synthesize the image.

Regarding claims 10-12, in the disclosure of Martinez it is inherent that the illumination variances, and position variations are being modeled together within the Hidden Markov Models.

Claim 13 is a method claim with the same limitations of claim 4, thus the same arguments used for claim 4 apply equally to the rejection of claim 13.

Claim 14 is a computer-readable recording medium claim with the same limitations as claim 4, thus the same arguments used for the rejection of claim 4 apply equally to claim 14.

Allowable Subject Matter

Claims 15-17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

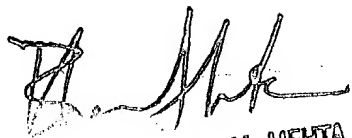than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to John B Strege whose telephone number is (703) 305-

8679. The examiner can normally be reached on Monday-Friday 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

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Business Center (EBC) at 866-217-9197 (toll-free).

JS

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